January 8, 2014

Ms. Amy Hensley
Work Assignment Manager
Office of Resource Conservation and Recovery
U.S. Environmental Protection Agency
1200 Pennsylvania Ave. NW
Washington, D.C. 20460

Contract No. EP-W-09-024
Work Assignment No. 4-05
National Grid/Envirojet PCB Sample Results

Dear Amy:

Enclosed please find a summary report documenting the analytical results for the wipe samples collected during the sampling event conducted on December 4-5, 2013, as part of the National Grid/Envirojet PCB Disposal Demonstration. The summary report is a deliverable under Task 3 of the work assignment statement of work. The summary report provides the PCB analysis results of the wipe samples, as well as a summary of the Quality Assurance/Quality Control (QA/QC) procedures and the final analytical data tables. If additional information on the analysis of the samples is required, a full laboratory data package can be provided.

If you have any questions, please contact me at (614) 424-5547.

Sincerely,

Kenneth Cowen
Work Assignment Leader

Enclosure

cc: Cynthia Bowie (EPA Project Officer)
Gail Hansen (Alternate EPA WAM)
Bruce Buxton (Battelle Program Manager)

National Grid/Envirojet PCB Disposal Demonstration
Wipe Sampling Event
Analytical Results Summary

A sampling event for the National Grid/Envirojet PCB Disposal Demonstration was conducted on December 4-5, 2013. Six wipe samples were collected during the sampling event. The samples were received at the Battelle Duxbury analytical laboratory on December 6 and immediately logged into the Battelle Laboratory Information Management System (LIMS).

The wipe samples and one blank sample were extracted by manual Soxhlet Method 3540C, and analyzed for PCB Aroclors by gas chromatography/electron capture detection (GC/ECD) in accordance with a modified version of EPA Method 8082A. Table 1 provides a summary of the analytical results in units of nanograms per 100 square centimeters (ng/100 cm^2) for each Aroclor analyzed in the wipe samples. Table 1 also provides the total PCB concentration, in units of ng/100 cm^2, as the sum of the Aroclor concentrations for each sample. These results provide the most conservative total PCB concentrations for the samples. That is, for the Aroclors resulting in a non-detect, the method detection limit (MDL) for that Aroclor was used to determine the total PCB concentration for each sample shown in Table 1.

Attachment A provides a narrative of the extraction and analysis procedures performed on the wipe samples. Attachment B provides the final analytical data tables for the samples, which were created from a direct transfer of the authorized LIMS data. Attachment C provides the Sample Custody Documentation related to sample receipt and handling. A full laboratory data package related to the analysis of the samples is available upon request.

TABLE 1. NATIONAL GRID/ENVIROJET WIPE SAMPLE RESULTS

Client ID	NG - PRE13	NG - PRE11	NG - PRE16	NG - POST13	NG - POST11	NG - POST16	BLANK
Battelle ID	M1214-P	M1215-P	M1216-P	M1217-P	M1218-P	M1219-P	M1220-P
Collection Date	12/05/13	12/05/13	12/05/13	12/05/13	12/05/13	12/05/13	12/06/13
Extraction Date	12/12/13	12/12/13	12/12/13	12/12/13	12/12/13	12/12/13	12/12/13
Analysis Date	12/17/13	12/18/13	12/18/13	12/18/13	12/18/13	12/18/13	12/18/13
Analytical Instrument	ECD	ECD	ECD	ECD	ECD	ECD	ECD
% Moisture	NA	NA	NA	NA	NA	NA	NA
Matrix	WIPE	WIPE	WIPE	WIPE	WIPE	WIPE	WIPE
Sample Size	100 cm^2	100 cm^2	100 cm^2	100 cm^2	100 cm^2	100 cm^2	100 cm^2
Units	ng/100 cm^2	ng/100 cm^2	ng/100 cm^2	ng/100 cm^2	ng/100 cm^2	ng/100 cm^2	ng/100 cm^2
Aroclor 1016	0.032 U	0.032 U	0.032 U	0.032 U	0.032 U	0.032 U	0.032 U
Aroclor 1221	0.032 U	0.032 U	0.032 U	0.032 U	0.032 U	0.032 U	0.032 U
Aroclor 1232	0.032 U	0.032 U	0.032 U	0.032 U	0.032 U	0.032 U	0.032 U
Aroclor 1242	70.6466	14.4147	57.3509	10.1405	13.8542	16.6965	0.032 U
Aroclor 1248	0.009 U	0.009 U	0.009 U	0.009 U	0.009 U	0.009 U	0.009 U
Aroclor 1254	0.009 U	0.009 U	0.009 U	0.009 U	0.009 U	0.009 U	0.009 U
Aroclor 1260	14.5842	0.009 U	0.009 U	0.009 U	0.009 U	0.009 U	0.009 U
Total (ng/100 cm^2)	85.3	14.5	57.5	10.3	14.0	16.8	0.2 U

U Analyte not detected at 3:1 signal:noise ratio. The method detection limit (MDL) is reported.

ATTACHMENT A

SAMPLE ANALYSIS NARRATIVE

PCB Aroclor – QA/QC Summary
Batch 13-0580

Project:	PCB Disposal Demonstrations – National Grid
Parameters:	PCB Aroclor
Laboratory:	Battelle-Duxbury, MA
Matrix:	Gauze Wipes
Data Set:	DP-13-0916
Analytical SOP:	5-128
Method Reference:	EPA 8082A modified

Sample Custody

Collection Date	Receipt Date	Temp (°C)
12/5/2013	12/6/2013	16.8

Corrective Actions	Samples were received at ambient temperature. All unused sample kits (hexane soaked gauze in jar) were returned with the samples. One jar was selected from the cooler by the sample custodian and used as a field blank.
Sample Storage	The samples were stored in freezer conditions (approx. -10° C) until extraction.
Related samples	NA

METHOD SUMMARIES

Sample Preparation	The sample and rinses were spiked with surrogates and extracted in methylene chloride using Soxhlet apparatus. The extract was dried over anhydrous sodium sulfate and concentrated over a water bath. The extracts were processed through a pre-packed Forisil cleanup column, and concentrated. The samples were fortified with internal standards (IS) just prior to analysis.
Prep comments	None.

Analysis	Extracts intended for PCB analysis were analyzed using gas chromatography/electron capture detection (GC/ECD), following Battelle SOP 5-128 which is based on key components described in EPA Method 8082A. Sample data were quantified by the method of internal standards, using the IS compounds. Calibration verification was performed at the beginning and end of each 24-hr. period in which samples were analyzed. The instrument was calibrated using a multi-level Aroclor 1016:1260 solution. A single point calibration of the identified Aroclor(s) was used to quantify the samples.

Holding Times	Extraction Date(s)		Analysis Date(s)	
	12/12/2013		12/17/2013	12/18/2013

PCB Aroclor – QA/QC Summary
Batch 13-0580

Procedural Blank (PB)	A PB was prepared with this analytical batch to ensure that the sample extraction and analysis methods are free of contamination.
<5 X MDL Samples >5 X PB	No exceedances noted.
	No comments.

Laboratory Control Spikes (LCS/LCSD)	An LCS and LCSD pair was prepared with this analytical batch. The percent recoveries of target analytes were calculated to measure accuracy. The relative percent difference of each target compound was calculated to measure data quality in terms of precision (extraction efficiency).
40-120% recovery <30% RPD	No exceedances noted.
	No comments.

Surrogate Recoveries	Two surrogate compounds were added prior to extraction, including PCB 34 and PCB 152. The recovery of each surrogate compound was calculated to measure data quality in terms of accuracy (extraction efficiency).
40 – 120%	Three exceedances noted.
	The surrogate recovery for PCB 34 in the LCS, LCSD, and field blank (M1220) were masked by an interference eluting at the same retention time as the surrogate. The recovery of the second surrogate, PCB 152, was within QC criteria. The recovery for PCB 34 is appropriately qualified "MI" indicating matrix interference. No further corrective actions were taken.

Initial Calibration (ICAL)	The GC/ECD was calibrated with six-level quadratic calibration curve for Aroclor 1016:1260.
$R^2 \geq 0.995$	No exceedances noted.
	No comments.

Independent Calibration Check (ICC)	The independent check was run after each initial calibration to verify the calibration. This standard is from a different source than the ICAL.
≤ 20% difference individual. ≤ 20% difference mean.	No exceedances noted.
	No comments.

Continuing Calibration Verification (CCV)	Continuing calibration standards were run every 24 hours to ensure that initial calibration is still valid.
≤ 20% difference individual. ≤ 15% difference mean.	No exceedances noted.
	No comments.

ATTACHMENT B

FINAL ANALYTICAL DATA TABLES

Battelle
The Business of Innovation

Project Client: Battelle Columbus Operations
Project Name: PCB Disposal Demonstrations - Wipe - National Grid
Project Number: 100030883-01

Client ID	NG - PRE13	NG - PRE11	NG - PRE16	NG - POST13	NG - POST11	NG - POST16	BLANK
Battelle ID	M1214-P	M1215-P	M1216-P	M1217-P	M1218-P	M1219-P	M1220-P
Sample Type	SA	SA	SA	SA	SA	SA	SA
Collection Date	12/05/13	12/05/13	12/05/13	12/05/13	12/05/13	12/05/13	12/06/13
Extraction Date	12/12/13	12/12/13	12/12/13	12/12/13	12/12/13	12/12/13	12/12/13
Analysis Date	12/17/13	12/18/13	12/18/13	12/18/13	12/18/13	12/18/13	12/18/13
Analytical Instrument	ECD	ECD	ECD	ECD	ECD	ECD	ECD
% Moisture	NA	NA	NA	NA	NA	NA	NA
% Lipid	NA	NA	NA	NA	NA	NA	NA
Matrix	WIPE	WIPE	WIPE	WIPE	WIPE	WIPE	WIPE
Sample Size	NA	NA	NA	NA	NA	NA	NA
Size Unit-Basis	NA	NA	NA	NA	NA	NA	NA
Units	NG	NG	NG	NG	NG	NG	NG
Aroclor 1016	3.2 U	3.2 U	3.2 U	3.2 U	3.2 U	3.2 U	3.2 U
Aroclor 1221	3.2 U	3.2 U	3.2 U	3.2 U	3.2 U	3.2 U	3.2 U
Aroclor 1232	3.2 U	3.2 U	3.2 U	3.2 U	3.2 U	3.2 U	3.2 U
Aroclor 1242	7064.66	1441.47	5735.09	1014.05	1385.42	1669.65	3.2 U
Aroclor 1248	0.9 U	0.9 U	0.9 U	0.9 U	0.9 U	0.9 U	0.9 U
Aroclor 1254	0.9 U	0.9 U	0.9 U	0.9 U	0.9 U	0.9 U	0.9 U
Aroclor 1260	1458.42	0.9 U	0.9 U	0.9 U	0.9 U	0.9 U	0.9 U

Surrogate Recoveries (%)

Cl3(34)	94	107	117	89	74	119	0 NMI
Cl6(152)	109	105	115	107	109	119	94

Not Surrogate Corrected

Analyzed by Restucci Jr, Richard
B2

Main: S13-0580ECD-Master_128-Final (2)

Battelle
The Business of Innovation

Project Client: Battelle Columbus Operations
Project Name: PCB Disposal Demonstrations - Wipe - National Grid
Project Number: 100030883-01

Client ID	Procedural Blank
Battelle ID	CA932PB-P
Sample Type	PB
Collection Date	12/12/13
Extraction Date	12/12/13
Analysis Date	12/17/13
Analytical Instrument	ECD
% Moisture	NA
% Lipid	NA
Matrix	SEDIMENT
Sample Size	NA
Size Unit-Basis	NA
Units	NG

Aroclor 1016	3.2 U
Aroclor 1221	3.2 U
Aroclor 1232	3.2 U
Aroclor 1242	3.2 U
Aroclor 1248	0.9 U
Aroclor 1254	0.9 U
Aroclor 1260	0.9 U

Surrogate Recoveries (%)

Cl3(34)	120
Cl6(152)	95

Not Surrogate Corrected

Analyzed by Restucci Jr, Richard
B3

PB: PB

Battelle
The Business of Innovation

Project Client: Battelle Columbus Operations
Project Name: PCB Disposal Demonstrations - Wipe - National Grid
Project Number: 100030883-01

Client ID	Laboratory Control Sample				Laboratory Control Sample Duplicate					
Battelle ID	CA933LCS-P				CA934LCSD-P					
Sample Type	LCS				LCSD					
Collection Date	12/12/13				12/12/2013					
Extraction Date	12/12/13				12/12/2013					
Analysis Date	12/17/13				12/17/2013					
Analytical Instrument	ECD				ECD					
% Moisture	NA				NA					
% Lipid	NA				NA					
Matrix	SEDIMENT				SEDIMENT					
Sample Size	NA				NA					
Size Unit-Basis	NA				NA					
Units	NG		Target	% Recovery	NG		Target	% Recovery	RPD (%)	
Aroclor 1016	815.97		800.72	102	807.18		800.72	101	1.0	
Aroclor 1221	3.2	U			3.2	U				
Aroclor 1232	3.2	U			3.2	U				
Aroclor 1242	3.2	U			3.2	U				
Aroclor 1248	0.9	U			0.9	U				
Aroclor 1254	0.9	U			0.9	U				
Aroclor 1260	759.71		804.00	94	735.83		804.00	92	2.2	
Surrogate Recoveries (%)										
Cl3(34)	0	NMI			0	NMI				
Cl6(152)	88				88					

Not Surrogate Corrected

Analyzed by Restucci Jr, Richard
B4

LCS: PB

ATTACHMENT C

SAMPLE CUSTODY DOCUMENTATION

Battelle
The Business of Innovation

ShpNo SHP-131206-03

Battelle Project No:

Sample Receipt Form

Approved: ☐ Authorized ☐

Project Number: | **Client:** EPA

Received by: Schumitz, Matt | **Date/Time Received:** Friday, December 06, 2013 12:00 AM

No. of Shipping Containers: 1

SHIPMENT

Method of Delivery: Commercial Carrier | **Tracking Number:** 7972 8550 6101

COC Forms: ☑ Shipped with samples ☐ No Forms

Cooler(s)/Box(es)

Cntr	Type	Tracking No.	Seal	Seal Condition	Container Condition	Temp C	Smps
1 of 1	Cooler	7972 8550 6101	Custody Seals	Intact	Intact	16.8	7

Samples

Sample Labels:
☑ Sample labels agree with COC forms
☐ Discrepancies (see Sample Custody Corrective Action Form)

Container Seals:
☑ Tape ☐ Custody Seals ☑ Other Seals (See sample Log)
☑ Seals intact for each shipping container
☐ Seals broken (See sample log for impacted samples)

Condition of Samples:
☑ Sample containers intact
☐ Sample containers broken/leaking (See Custody Corrective Action Form)

Temperature upon receipt (°C): 16.8 Temperature Blank used ☑ Yes ☐ No
(Note: If temperature upon receipt differs from required conditions, see sample log comment field)

Samples Acidified: ☐ Yes ☐ No ☑ Unknown

Initial pH 5-9?: ☐ Yes ☐ No ☑ NA
If no, individual sample adjustments on the Auxiliary Sample Receipt Form

Total Residual Chlorine Present?: ☐ Yes ☐ No ☑ NA
If yes, individual sample adjustments on the Auxiliary Sample Receipt Form

Head Space <1% in samples for water VOC analysis: ☐ Yes ☐ No ☑ NA
Individual sample deviations noted on sample log

Samples Containers:
Samples returned in PC-grade jars: ☐ Yes ☐ No ☑ Unknown /Lot No.: Unknown

Storage Location: Chem South: Refrigerator - R0003 (Upper Cold | **BDO IDs Assigned:** M1214 - M1220

Samples logged in by: Schumitz, Matt | **Date/Time:** 12/06/2013 12:00 AM

Approved By: | **Approved On:**

Authorized By: | **Authorized On:**

Battelle
The Business of Innovation

ShpNo: SHP-131206-03

Battelle Project No: 0030883-01

Report Corrective Actions

Corrective Action No: 1 of 1

Authorized ☐ Approved: ☐

COC Client: EPA
COC Project: National Grid/Envirojet
COC Date: 12/6/2013 1:22:

	Description of Problem:	Explanation:
Client Id	Other	Client asked for us to add the TB to the COC. There were many extra unused sampling jars in the shipment and one jar was picked at random to use.
Temperature and Preservation	Receipt temperature outside of acceptability	Samples arrived at 16.8 degrees

Documentation of project manager notification

Sample Custodian Schumitz, Matt **Date:** 12/6/2013 1:32:00 PM
Laboratory Manager: Lizotte Jr, Robert **Date:** 12/9/2013 3:36:00 PM
Project Manager Peven-McCarthy, Carole **Date:** 12/9/2013 10:31:00 A

Documentation of client notification (should be completed by project manager within 24 hrs):

On _____ **I contacted** _____ **at**

Results of communication with client (Describe any corrective action directed by the client):

Battelle PM contacted. Temperature noted and PM requested analysis of an unused samples as an equipment blank.

Date this form was received back to the custodian: _____
Reference Number: _____

Battelle
The Business of Innovation

Chain of Custody

397 Washington Street
Duxbury, MA 02332
Phone: 781-952-5200
Fax: 781-934-2124

Proj. No

Proj. Name National Grid EnviroBA

SAMPLERS: Signature

DATE	TIME	BATTELLE ID	CLIENT ID	SAMPLE DESCRIPTION	PEST	PCB	TPH FINGERPRINT	PAH	VOA	TBT	METALS	OTHER	ACIDIFIED	PRESERVED	Total Number of Containers
				ANALYSIS REQUESTED → "NUMBER OF CONTAINERS"											
12-5-13	10:30	M1214	NG-PRE'13	~~E13~~ E13-0002-13; 4"		X									1
2-5-13	10:30	M1215	NG-PREX11	E13-0002-11; 4"		X									1
2-5-13	10:30	M1216	NG-PREX16	E13-0002-16; 6"		X									1
2-5-13	1:50	M1217	NG-POST 13	E13-0002-13		X									1
2-5-13	1:50	M1218	NG-POST 11	E13-0002-11		X									1
2-5-13	1:50	M1219	NG-POST 16	E13-0002-16		X									1
2-6-13	12:00	M1220	Blank	Blank (MS 12-6-13)		α									1

Relinquished by:

Date/Time: 12-5-16 2:15pm

Received by:

Date/Time: 12-6-13 1000

Relinquished by:

Date/Time:

Received by:

Date/Time:

Comments:

ORIGINAL

Schumitz, Matthew

From: Cowen, Kenneth A
Sent: Friday, December 06, 2013 12:02 PM
To: Schumitz, Matthew; Peven, Carole-Sue
Subject: RE: National Grid/Envirojet samples

Sure.

From: Schumitz, Matthew
Sent: Friday, December 06, 2013 11:52 AM
To: Peven, Carole-Sue; Cowen, Kenneth A
Subject: RE: National Grid/Envirojet samples

Would you also like me to add a Trip Blank sample to the COC?

Matthew Schumitz

Sample Custodian

781-952-5270

From: Peven, Carole-Sue
Sent: Friday, December 06, 2013 11:38 AM
To: Cowen, Kenneth A
Cc: Schumitz, Matthew
Subject: RE: National Grid/Envirojet samples

Hi again Ken! We also received back the Teflon bottle and the graduated cylinder. They're considered government property – where should we send them? I know we've gotten "in trouble" before for using equipment purchased on a gov't contract, so if we can send them to EPA, let us know.

Thanks!
Carole

From: Cowen, Kenneth A
Sent: Friday, December 06, 2013 11:27 AM
To: Peven, Carole-Sue
Cc: Thorn, Jonathan R; Schumitz, Matthew
Subject: RE: National Grid/Envirojet samples

Hi Carole,

Yes, those are the samples from September. The project number is 100030883-01. Aroclor analysis please. Please extract and run one of the unused samples as a trip blank.

Thanks,
Ken

From: Peven, Carole-Sue
Sent: Friday, December 06, 2013 10:51 AM
To: Cowen, Kenneth A
Cc: Thorn, Jonathan R; Schumitz, Matthew
Subject: National Grid/Envirojet samples

Good morning Ken! Happy December/Happy Friday! So, we received samples today that we assume are related to the sampling kit we helped prepare back in the end of September. There are a total of 6 wipe samples; custody is attached.

Please let us know how to proceed. Do we have a project number? Are these for Aroclor or congener analysis? Only a fraction of the jars were used, however we don't know how they were stored and they arrived at ambient temperature, so I don't think it's appropriate to retain the unused samples. We'll dispose of them as required. (Matt – please hold onto one or two of the unused jars – we may want to extract and run them to check PCB concentrations for background measurements.)

Thanks Ken – hope all is well,

Carole

Carole Peven McCarthy
Battelle
Analytical Chemistry Services
397 Washington Street
Duxbury, MA 02331

Direct Line: 781.952.5232

Battelle
The Business of Innovation

ShpNo SHP-131206-03

Battelle Project No:

Sample Receipt Form Details

Approved: ☐ **Authorized** ☐

Project Number:

Client: EPA

Received by: Schumitz, Matt

Date/Time Received: Friday, December 06, 2013 12:00 AM

No. of Shipping Containers: 1

BDO Id:	Client Sample ID:	Collection Date:	Login Date:	Ctrs:	Matrix:	Temp:	pH:	TRC:	VOC:	Stored In:	Loc:	No:	Comments:
M1214	NG - PRE13	12/05/13 10:30	12/06/13 13:29	1	WIPE	16.8	NA	NA	NA	F0002 (Walk-in)			
M1215	NG - PRE11	12/05/13 10:30	12/06/13 13:29	1	WIPE	16.8	NA	NA	NA	F0002 (Walk-in)			
M1216	NG - PRE16	12/05/13 10:30	12/06/13 13:29	1	WIPE	16.8	NA	NA	NA	F0002 (Walk-in)			
M1217	NG - POST13	12/05/13 13:50	12/06/13 13:30	1	WIPE	16.8	NA	NA	NA	F0002 (Walk-in)			
M1218	NG - POST11	12/05/13 13:50	12/06/13 13:30	1	WIPE	16.8	NA	NA	NA	F0002 (Walk-in)			
M1219	NG - POST16	12/05/13 13:50	12/06/13 13:30	1	WIPE	16.8	NA	NA	NA	F0002 (Walk-in)			
M1220	BLANK	12/06/13 12:00	12/06/13 13:30	1	WIPE	16.8	NA	NA	NA	F0002 (Walk-in)			

Total Samples: 7

From: (614) 424-3542
Colleen Gunderson
Battelle Memorial Institute
505 King Avenue

Columbus, OH 43201

Origin ID: GQQA

FedEx Express

J13201306280326

Ship Date: 02DEC13
ActWgt: 20.0 LB
CAD: 5897573/INET3430

Dims: 30 X 18 X 18 IN

Delivery Address Bar Code

SHIP TO: (781) 952-5270 BILL SENDER

Matt Schumitz
Battelle Duxbury Operations
397 WASHINGTON ST

DUXBURY, MA 02332

Ref # 31820926
Invoice #
PO #
Dept #

16.8 TB ✓
C21754

TUE - 03 DEC 10:30A
PRIORITY OVERNIGHT

TRK# 0201 7972 8550 6101

EM XPUA

02332
MA-US
BOS

51AG4/99D5/1A9E

After printing this label:
1. Use the 'Print' button on this page to print your label to your laser or inkjet printer.
2. Fold the printed page along the horizontal line.
3. Place label in shipping pouch and affix it to your shipment so that the barcode portion of the label can be read and scanned.

Warning: Use only the printed original label for shipping. Using a photocopy of this label for shipping purposes is fraudulent and could result in additional billing charges, along with the cancellation of your FedEx account number.
Use of this system constitutes your agreement to the service conditions in the current FedEx Service Guide, available on fedex.com.FedEx will not be responsible for any claim in excess of $100 per package, whether the result of loss, damage, delay, non-delivery,misdelivery,or misinformation, unless you declare a higher value, pay an additional charge, document your actual loss and file a timely claim.Limitations found in the current FedEx Service Guide apply. Your right to recover from FedEx for any loss, including intrinsic value of the package, loss of sales, income interest, profit, attorney's fees, costs, and other forms of damage whether direct, incidental,consequential, or special is limited to the greater of $100 or the authorized declared value. Recovery cannot exceed actual documented loss.Maximum for items of extraordinary value is $1,000, e.g. jewelry, precious metals, negotiable instruments and other items listed in our ServiceGuide. Written claims must be filed within strict time limits, see current FedEx Service Guide.